

Structure Strength & Stability

Your catapult will need to be free-standing, use this experiment to investigate how to make structures stable and strong. N.B. Cocktail sticks have sharp points!

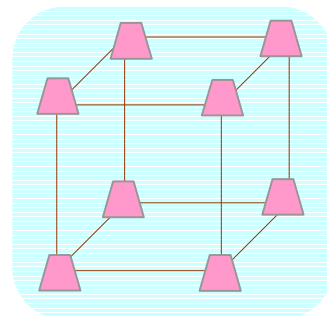
You will need

- Cocktail sticks or spaghetti
- Marshmallows or jelly sweets

Method

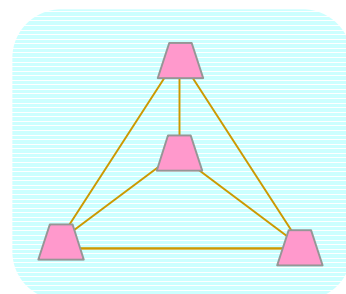
Basic shape 1 – the cube - 12 sticks 8 sweets

1. Start with 4 cocktail sticks (or spaghetti) and 4 sweets. Poke the cocktail sticks into the sweets to make a square with a sweet at each corner.
2. Then poke another stick into the top of each sweet. Put a sweet on the top of the sticking up cocktail sticks. Connect the sweets with sticks to form a cube.



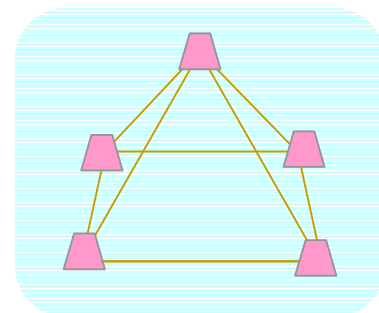
Basic Shape 2 – the triangle based pyramid - 6 sticks, 4 sweets

1. Start with 3 sticks and 3 sweets, Poke the sticks into the sweets and join up to make a triangle.
2. Poke a stick into the top of each sweet then bend them towards the centre. Poke all three sticks into a sweet at the top to make a pyramid shape



Basic Shape 3 – the square based pyramid - 8 sticks 5 sweets

1. Start with 4 cocktail sticks and 4 sweets. Poke the cocktail sticks into the sweets to make a square with a sweet at each corner.
2. Poke a stick into the top of each sweet then bend them towards the centre. Poke all four sticks into a sweet at the top to make a pyramid shape



Now try to build:

- The tallest structure
 - The structure that hold the most weight – use coins or 10g masses to measure
- You could set a challenge with a limit on the number of sticks and sweets you can use.

Things to think about

- Which shapes have you the most stability?
- What happens when you build a tall structure?
- Is a tall structure better with a large or small base?
- Are triangles better than squares? Why?